

Notice of Allowability

Application No.

09/639,515

Applicant(s)

HALDER, BIJIT

Examiner

Jean B Corielus

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/10/04@9/28/04.
2. ☒ The allowed claim(s) is/are 1, 2, 4, 6, 15-22, renumbered as 1-13, respectively.
3. ☒ The drawings filed on 23 March 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 2/16/01
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Jean B Corielus
Primary Examiner
Art Unit: 2637

12/1/04

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a couple of telephone interviews with Eric K. Proul on 10/06/04 and 12/1/04.

The application has been amended as follows:

IN THE CLAIMS:

1. (Currently amended) A high-speed, broadband, wireline modem including an adaptive equalizer having both a training mode and a decision-directed[,] non-training mode, the adaptive equalizer comprising:

at least one of: a forward path coupled to [the] receive signal samples, the forward path including a forward filter and a decision element, and a feedback path coupled between an output of the decision element and an input of the decision element, the feedback path including a feedback filter; and

means for adapting the one of said forward filter and said feedback filter based on a least squares error criterion performed substantially according to the following computation:

$$e_p = e(1 - K^T X_{fast})$$

wherein e is [the] a forward prediction error, K is [the] a Kalmann Gain and X_{fast} is an input vector.

2. (Currently amended) The adaptive equalizer of Claim 1, further comprising a memory for storing the received signal samples.

4. (Currently amended) The adaptive equalizer of Claim 1, wherein the means for adapting operates during said decision-directed non-training mode.

15. (Currently amended) A high-speed, broadband, wireline modem including an adaptive equalizer having both a training mode and a decision-directed[,] non-training mode, the adaptive equalizer comprising:

at least one of: a forward path coupled to [the] receive signal samples, the forward path including a forward filter and a decision element, and a feedback path coupled between an output of the decision element and an input of the decision element, the feedback path including a feedback filter; and

means for adapting the one of said forward filter and said feedback filter based on a least squares error criterion performed substantially according to the following computation:

$$F_{fast} = \lambda_i F_{fast}$$

$$c_n = F_{fast} \frac{e_p}{1 + e^T F_{fast} e_p}$$

$$F_{fast} = F_{fast} - c_n e^T F_{fast}$$

$$b_n = K_{fast} + A_{fast} c_n$$

wherein F_{fast} , A_{fast} and c are filter coefficients, e is [the] a forward error prediction, λ is an error criterion, and b is a backward error predictor.

16. (Currently amended) The adaptive equalizer of Claim 15, further comprising a memory for storing said received signal samples.

17. (Currently amended) The adaptive equalizer of Claim 15, wherein the means for adapting operates during said decision-directed non-training mode.

19. (Currently amended) A high-speed, broadband, wireline modem including an adaptive equalizer having both a training mode and a decision-directed[,] non-training mode, the adaptive equalizer comprising:

at least one of: a forward path coupled to [the] receive signal samples, the forward path including a forward filter and a decision element, and a feedback path coupled between an output of the decision element and an input of the decision element, the feedback path including a feedback filter; and

means for adapting the one of said forward filter and said feedback filter based on a least squares error criterion performed substantially according to the following computation:

$$K_{fast} = (m - (D_{fast} \mu)) / (1 - \eta^T \mu)$$

$$D_{fast} = D_{fast} - K_{fast} \eta^T$$

wherein K_{fast} is [the] a Kalmann Gain, D_{fast} is [the] a backward predictor coefficient[s] and m , μ , and η are backward prediction errors.

20. (Currently amended) The adaptive equalizer of Claim 19, further comprising a memory for storing said received signal samples.

21. (Currently amended) The adaptive equalizer of Claim 19, wherein the means for adapting operates during said decision-directed non-training mode.

Claims 23-26 have been cancelled.

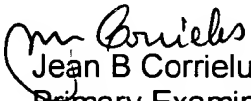
IN THE SPECIFICATION:

The abstract has been replaced by the attached sheet.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-3086. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jean B Corrielus
Primary Examiner
Art Unit 2637
12/1/04

Abstract of the disclosure

A high-speed, broadband, wireline modem including an adaptive equalizer having both a training mode and a decision-directed non-training mode. The adaptive equalizer comprising at least one of a forward path coupled to receive signal samples, the forward path including a forward filter and a decision element, and a feedback path coupled between an output of the decision element and an input of the decision element, the feedback path including a feedback filter; and means for adapting the one of said forward filter and said feedback filter based on a least squares error criterion performed substantially according to a predetermined algorithm.